# DRIVER

JULY 1973

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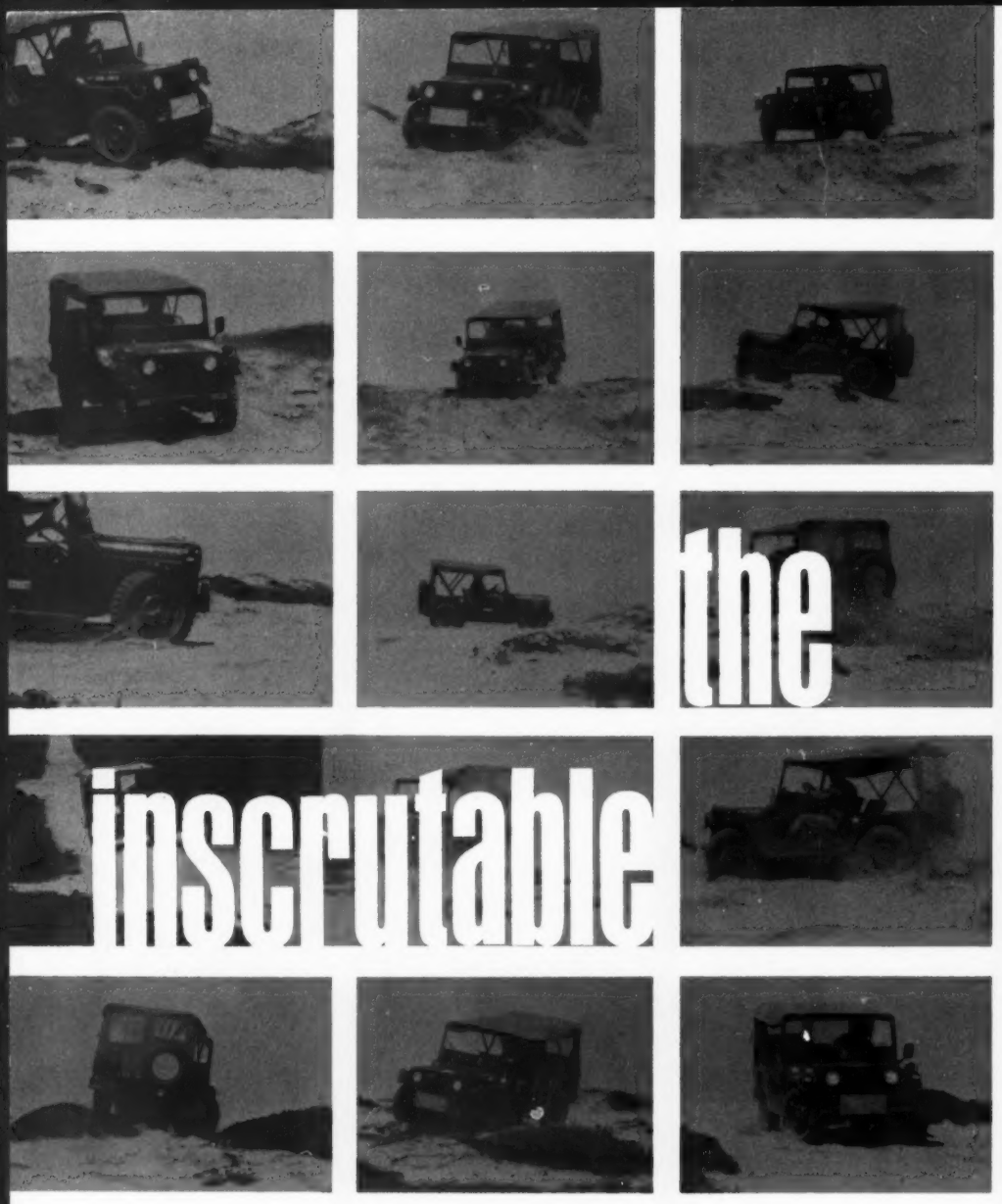

# the inscrutable military JEEP

*It's not as harmless as it looks*

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**Well suited** to cross-country travel, the M151A1 Jeep has four-wheel drive, independent wheel suspension, and a short wheelbase that make it more risky to drive on the road than in the boondocks.

The M151A1 (hereafter called the M151) Jeep is not the overgrown toy you might think it is. The appearance is deceiving and conceals design characteristics that can trap the unwary driver and zap him. The Jeep was designed for a variety of military uses and is capable of tough cross-country operation if properly handled. But, if you treat it with disdain, the unusual suspension of the M151 Jeep can turn it into a dangerous vehicle.

The M151 has an unsavory reputation. Like all such reputations, there are some facts to back them up, and a lot of rumors. DRIVER presents the facts.

◇ ◇ ◇

The M151 Jeep has four-wheel drive, a short wheelbase, and independent wheel suspension. These features give the little vehicle cross-country handling second to none. The Jeep's bad reputation is a result of its lack of performance on paved roads, where it steers and handles under a whole new set of rules. Special driver training is needed to learn

*continued*

# DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

DEPARTMENT OF THE AIR FORCE

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NEXT MONTH

Gasoline Special

THE EDITOR SPEAKS

## DOUBLE CLUTCH

### Getting Involved in YOUR Magazine

I received a recent call from a sergeant in Texas who made an offer I couldn't refuse. He said he thought DRIVER might be interested in receiving some information and photos covering his participation in sanctioned drag racing. He expressed pride in the National Hot Rod Association's safety record, and had comments to pass on to fellow servicemen concerning the legal protection afforded by a commander's approval, plus information and tips derived from 16 years' membership in NHRA. I told him to fire away, that his contributions would be given favorable consideration.

The week before, I had received an article and letter from an Airman First. He was also stationed in Texas, and said his motorcycling article had been rejected by two base newspapers because of length. But he wasn't about to give up yet on getting it published, because it was an unusual article with an important message. I agreed with him. The article, "Sixty Feet of Texas Highway," appeared on page 18 of the June '73 DRIVER.

DRIVER is indebted to these two fellows. They recognize the magazine for what it is. It is the readers' magazine, and depends on their (your) involvement and support to be truly effective.

So if any of you have articles, story ideas, comments, or suggestions, please get in touch. While reading DRIVER you could hardly have missed noting the variety and spirit of our material. Since you know what our bag is, why not let us know yours? •


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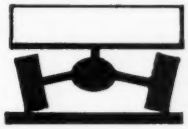
## Fig. 1 HANDLING CHARACTERISTICS IN A TURN

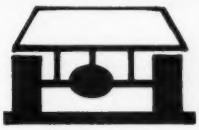
### M151A1 MILITARY JEEP



**HIGH-SPRUNG INDEPENDENT SUSPENSION**

**Characteristics:**

- Axle/wheel angle results in an additional steering force from the rear wheels in a corner.
- The Jeep's front end turns very sharply into a corner (oversteers) because the rear wheels, as well as the front wheels, exert a turning force on the vehicle. Relatively little steering wheel movement is required to make the turn.



### CONVENTIONAL AMERICAN AUTO

**SOLID REAR AXLE SUSPENSION**

**Characteristics:**

- Only the front wheels turn the vehicle in a corner.
- Normal auto "understeers" in a corner. The vehicle's front end turns slowly into the corner since the rear wheels push the vehicle straight ahead as only the front wheels exert a turning force. More steering wheel movement is required to make the turn.

In a turn, the suspension forces the rear end to the outside of the corner, causing the rear wheels, as well as the front wheels to turn the Jeep. This additional steering force coupled with the Jeep's high-ratio steering results in a dangerously quick steering reaction (oversteer). Any abrupt steering inputs are hazardous even when traveling in a straight line. An excellent Army film, TF-6163, "Operation of the M151 ¼-Ton Utility Truck," goes into further detail on this subject.

In a turn, the rear wheels push the vehicle straight while the front wheels exert the only turning force. The car tends to push, or plough straight through the turn. This, coupled with low-ratio steering, results in a slow steering reaction (understeer).

continued

## THE INSCRUTABLE MILITARY JEEP

all about the Jeep's peculiar habits and how to counteract them.

DRIVER went to the U.S. Army's Jeep operator training course at Fort Ord, California, and learned what causes most of the Jeep's flip-and-roll accidents, and how to avoid them.

We were told the biggest menace the Jeep holds for its driver is that it gives little or no warning when it approaches the rollover point. You can't rely on a "seat of the pants" feel as you can in a conventional vehicle. The driver's first indication of approaching trouble usually occurs when the scenery starts to revolve.

**The M151A1 Jeep** is a rough, tough little vehicle that will carry you over almost any kind of terrain. But, if you treat it with disdain, the Jeep's unusual split axle suspension will quickly turn it into a very dangerous little vehicle.

**DRIVER WARNINGS**

Army authorities know all about the Jeep's tricky road handling characteristics and have set its recommended top speed at 50 mph. Also, there is a dashboard sign, right in front of the driver, that states: "Drive these vehicles carefully. They have more responsive steering and more available power than other vehicles you are accustomed to driving.

**Jeep driving** training sessions are tempered with frequent rest stops and productive rap sessions with instructors. The course includes 8-hours behind-the-wheel driving, plus classroom work.

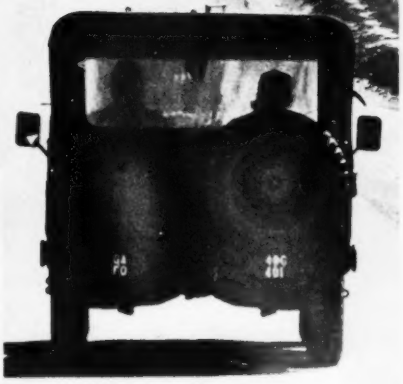
**When the rear end** breaks loose in a turn, get off the gas and steer the way the rear end is headed; not into the turn as with a conventional solid rear axle vehicle.

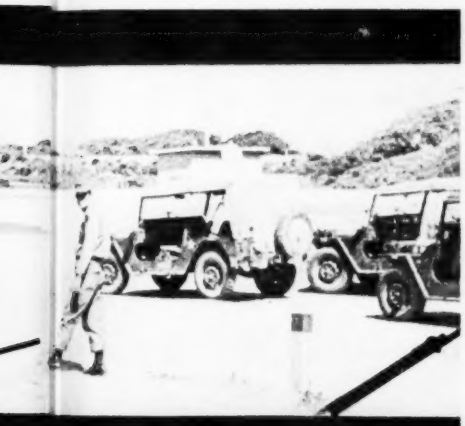
Reduce speed before entering turns. A full right or left turn at speeds above 20 mph can cause these vehicles to go out of control and/or turn over."

Instructors consider the Jeep's speedometer the most important instrument on the panel when it comes to safe handling on the road, and many Jeeps have color-coded speedometers. The green arc shows the safe operating speeds (0-30 mph), the yellow arc shows the speeds at which special caution must be used (30-50 mph), and the red arc defines the prohibited speeds (over 50 mph).

#### REAR WHEELS STEER

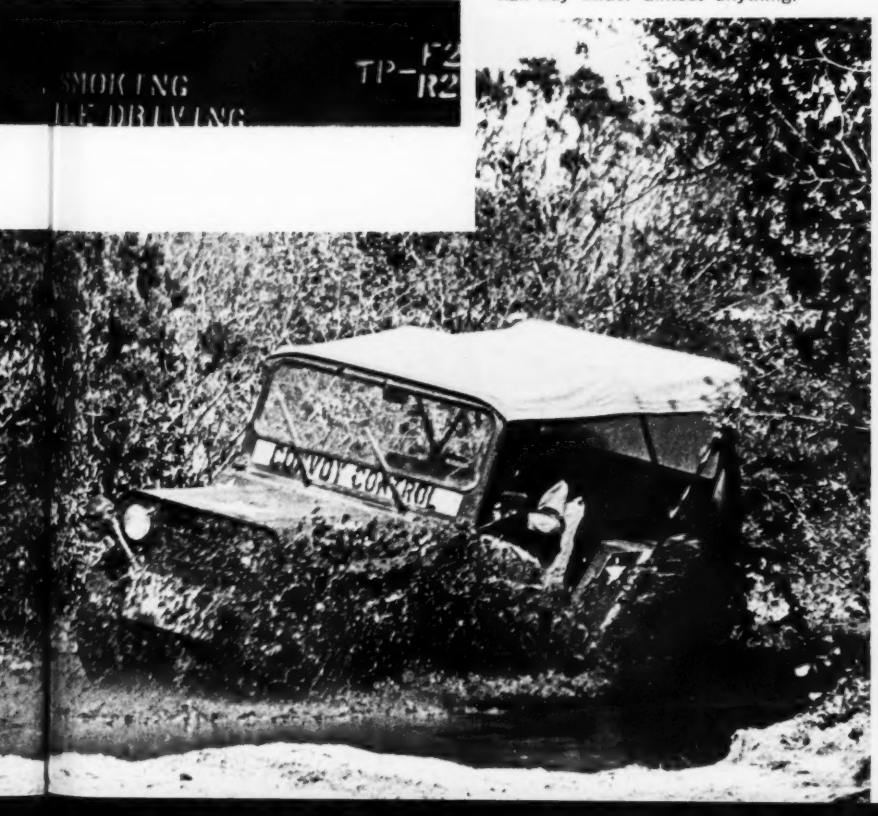
The key to the Jeep's control problems in turns lies in its suspension (Fig. 1). In a turn, the suspension pushes the Jeep's rear end to the outside of the corner, causing the rear wheels, as well as the front wheels, to steer the vehicle. This "4-wheel steering" makes the Jeep turn very quickly into corners with only a slight movement of the steering wheel





**It looks like** a meek, docile little vehicle on the road, but a sharp swerve or turn will lay it on its side, or roll it. On a paved road surface, always drive with the four-wheel drive disengaged.

**It goes through,** over, or sometimes half-way under almost anything.




(oversteer). The oversteer condition, coupled with the Jeep's high-ratio (super responsive) steering, and the Jeep body's high center of gravity spells big trouble. *If turned too quickly into a sharp corner, the Jeep will roll over.*

There's still another problem in making hard turns in the Jeep; the inside rear wheel will leave the ground, which reduces traction and makes steering control even more difficult.

**MINIMAL LEAN IN CORNERS**

When a solid rear axle car breaks loose in a turn, the driver needs to get off the gas to reduce the power going to the rear wheels. He is usually warned by the vehicle's lean that something is about to happen. The front end will also start to plow out of the turn at this point. By cutting down the power, the rear drive wheels have a chance to get a better grip on the road, and the driver can then steer gently into the turn until he has the situation under control.

The M151 Jeep, however, is a different kind of animal. When it starts to break loose in a turn, the driver has little or no vehicle lean to warn him. Because of the split rear axle, the Jeep's rear wheels tend to add to the turning effect of the front wheels. Things get wild fast as the turn rapidly gets tighter.

At this point the untrained Jeep driver gets into trouble. He will usually tramp down on the brakes, because all his driving instincts are pressuring him to slow down—now! When the brakes go on, the Jeep goes over.

In this situation, the best corrective action is to get off the gas—leave the brakes alone, and steer in the direction the rear end is sliding. This might seem far out, but there are several good reasons for it. The split rear axle allows the inside rear wheel to lift off the ground and tuck under. When the wheel hits the ground again, it will force the Jeep into a rollover. By turning with the rear end, the driver gets the inside rear wheel back down on the ground in a straight line. This increases tire traction and helps eliminate the possibility of a roll. At the same time, he is counteracting the turning forces of the rear wheels that are trying to push the front

*continued on page 28*

# BOATING, PART I

## Tips from DRIVER and the Coast Guard to make your boating more fun

Few people are not affected by the magic lure of the open water. Boating offers excitement, satisfaction, and a refreshing change from the routine of suburbia. But no matter what your bag—speedboating, trolling, day sailing, or ocean cruising—there are important things to know before venturing out on the water.

### "HOW TO" COURSES

Before you make the boating scene, there's a good way to find out what it's all about. Free boating courses are offered nationwide by the U.S. Coast Guard Auxiliary, and U.S. Power Squadrons. These courses will help you get started on the right foot by exposing you to such important seamanship matters as right-of-way, basic navigation, terminology, chart reading, and boat lighting requirements. By the way, insurance companies may require attendance at such courses, or membership in a Power Squadron, to qualify for discounts on boat insurance.

Watch your local daily bulletin, plan-of-the-day, or newspaper in the spring months for announcement of these courses. Or, you can contact the Director of Auxiliary, in the Coast Guard District nearest you; or write the U.S. Power Squadron National Headquarters, P.O. Box 510, Englewood, New Jersey 07631, for the location of the nearest Power Squadron.

Newcomers to boating, particularly sailing, are sometimes overwhelmed by its complex terminology. They may wonder why it's necessary to learn the names of the running and standing rigging, plus all the fittings on a sailboat. Why call some ropes "sheets," others "halyards," and still others "lines." Who cares about cleats, winches, booms, outhauls, downhauls, leeches, and bellies?

Well, it's *all* important. Sure, some terminology is clung to through tradition; sailing being one of the oldest modes of transport. But the real reason for learning the terminology is survival. If the man at the tiller yells, "Jibe-O, duck the boom," and you don't respond correctly, chances are you will be knocked unconscious, and perhaps drowned. If, in a bad gust of wind, he commands, "Uncleat the starboard jib sheet," and this is not accomplished immediately, the craft will probably capsize, if it is a smaller sailboat.

So, if you don't want to be put in a dangerous position, or be a foreigner to good seamanship, learn the terminology that applies to the craft you are involved with.

### LICENSING

Your boat must be state licensed and display the number on each side of the

# Before Casting Off

Boating is a family affair. Everyone should have a job in preparing the boat for use. Even the little ones can be given small chores to do.

bow.* In some states licensing is accomplished through the state motor vehicle licensing bureau. In other states, it is necessary to apply for the license at the county court house. Your local Coast Guard unit or Power Squadron can provide information on where to obtain the license, and on the fees involved.

Boat trailer licensing and inspection is normally a service of the state motor vehicle licensing bureau. Make sure your trailer has the necessary lights, in working order, and a safety chain connecting the trailer tongue to the hitch. Also, find out the legal limits for boat overhang, and check this measurement against your boat and trailer.

### CHECKLISTS, PRESERVERS, AND EXTINGUISHERS

Preparing your boat for trailering and launching doesn't sound very difficult. It's not, but it does involve remembering a lot of details easily overlooked in the excitement of preparing for a day on the water. Here's where a checklist becomes a great idea for the motorboater, and a necessity for the sailor. There's nothing like discovering you and your catamaran are sinking because you forgot to bring along and install the bilge drain plugs prior to launch.

We have included two motorboat checklists with this article (see Fig. 1

*continued*

* *See "Federal Requirements for Operation of Watercraft," page 10.*

and 2, page 8). These lists, however, are only partial guides to checks on installed equipment. DRIVER recommends you tailor your checklist to the boat concerned, and make the list far more comprehensive.

At the top of the checklist should be a check for life preservers. One preserver is required for each person aboard the boat. Take extras in case you have additional guests in your party.

The smart boater wears his life preserver whenever the going gets rough, if not more often. Youngsters and non-swimmers should wear them at all times, except when sleeping below deck in boats with cabins. If life preservers are not in use, they should be stored where they can be reached in a hurry, such as in the cockpit of the boat. In the event of "Man overboard!" one of the first steps to be taken is to heave a life preserver to the individual in the water. This not only gives him a buoyant object to cling to, but also makes his location more visible to rescuers.

When boating in waters where a deep swell is running, such as the ocean or ocean bays, it is essential to carry on deck a flotation collar with a pole and marker pennant attached. This device, when correctly displayed, enables rescuers to sight an individual who has

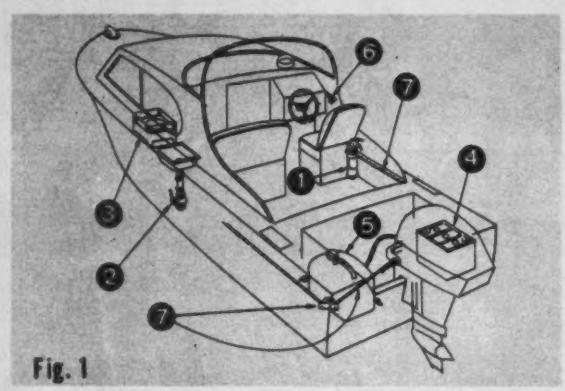


Fig. 1

## SAFETY CHECK-OFF LIST FOR OUTBOARD

*Here are some of the principle hazards of the outboard boat:*

**1. FIRE EXTINGUISHER** .....
Even if not required by law, a Coast Guard approved fire extinguisher is a MUST for the safety-minded outboard skipper.

**2. THROUGH-HULL FITTINGS** .....
Sink and toilet, through-hull fittings should be equipped with a working sea-cock. All hoses and clamps should be tight and in good condition.

**3. COOKING STOVE** .....
With motors in the open, the danger of fire on an outboard boat is greatly reduced. The stove, however should be of an approved type and kept securely fastened down when in use.

**4. BATTERY** .....
If a battery is used for starting and lights, it should be stowed safely out of the way and securely fastened.

**5. FUEL** .....
Fuel tanks should be stowed safely out of the way with all fuel lines clear of foot traffic and securely fastened.

**6. MOTOR CONTROLS** .....
All levers, brackets, pulleys, cables should be in good condition, with no points of binding and cables free of kinks.

**7. STEERING CONTROLS** .....
All controls, brackets, pulleys, sheaves and cables in good order with no binding points and cables free of kinks.

*An additional hazard is frequently found in outboard boats — A transom which is too low. This can be extremely dangerous in a following sea, when backing or in heavy weather. Most manufacturers' transom designs are safe but there are still many boats on the market with dangerously low-cut transoms. Be sure to check this point when selecting your boat.*

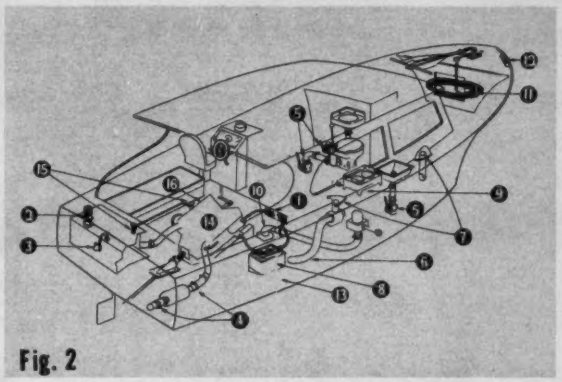


Fig. 2

## INBOARD SAFETY CHECK-OFF LIST

*This check list is designed to help you make sure of the safe condition of your boat before the season starts. Use it for an occasional check during the summer, too.*

| | | YES | NO |
|---|---|---|---|
| 1. | Does wiring terminate in accessible fuse panel? | | |
| 2. | Is there a static ground wire across non-metallic section of fuel fill? | | |
| 3. | Is there an adequate screened vent from gasoline fuel tank? | | |
| 4. | Are all hose clamps in good condition? | | |
| 5. | Are there sea cocks in good working condition on all through-hull fittings? | | |
| 6. | Is exhaust vent ducting carried low into bilges? | | |
| 7. | Are there two ventilator cowls, with ducts, on each side? | | |
| 8. | Is battery secured against movement? | | |
| 9. | Is stove secured against movement? | | |
| 10. | Is sump screen on bilge pump clean? | | |
| 11. | Is there a chain leader connecting anchor to anchor line? | | |
| 12. | Are mooring cleats and chocks smooth to prevent chafing? | | |
| 13. | Is the bilge clean and free of oil and grease? | | |
| 14. | Are all gasoline line connections tight and leak-proof? | | |
| 15. | Is there an adequate spark arrestor in good condition on carburetor? | | |
| 16. | Are there shut-off valves at both tank and engine on gasoline fuel line? | | |

fallen overboard, despite the swells. Chances for rescue in a heavy sea without this device are very poor.

Another vital item aboard any boat is the fire extinguisher. The size of the boat determines the number required. They should be properly charged and strategically located in critical fire areas, such as near the engine and galley. Show all crew members and passengers how to break the seal and operate the extinguisher.

**FLARES, BAILING DEVICES, AND "SWINGING" COMPASSES**

If you are unlucky enough to have engine failure in your power boat, you will probably require assistance. Coast Guard patrol boats are constantly on the lookout in major boating areas, and will lend a hand if you indicate a need for assistance. Flares are a must for this purpose, particularly if you are caught out after dark. Keep a good supply of flares stored in a dry and convenient location. A good spot is in the tool kit with your emergency set of tools, flashlight, and foghorn.*

Sometimes it's hard to imagine a need for bailing equipment, especially on a clear, sparkling day, with hardly a ripple on the water. But weather conditions on the water change fast. In practically no time you may find your boat in conditions similar to a storm scene from the "Caine Mutiny," with small craft warnings flying, and boats scurrying for port. Bailing equipment may become invaluable in such a situation when your small craft starts taking on gobs of water. It also helps to have a bilge pump or bailing equipment ready to deal with leaks below the waterline as a result of damage.

A boat compass is the most important navigation device aboard a boat. This delicate instrument requires periodic calibration, known as "swinging the compass." This should be accomplished by a licensed marine instrument repairman. He can also make sure your compass is correctly located on the boat. A compass can be thrown out of kilter and become erratic if located near a large metal mass, such as the engine.

**MOTORS AND BATTERIES**

In most small boats, a single motor provides the only power source. If it quits you may be in serious trouble, so make sure the engine is in good condition before casting off.

When you take a motor out of storage to ready it for the boating season, drain out the heavy storage oil. Refill with the correct running weight oil, and replace the lower gearcase grease.

Install new spark plugs, points, and condenser. Make a compression check to determine the condition of the valves and rings.

continued

## BEFORE CASTING OFF

Be especially thorough when checking the fuel lines and connections. A fuel leak in a boat can be very dangerous.

The propeller should be examined for broken or bent blades. Also, have a look at the shear pin connecting the prop to the driveshaft, to make sure it isn't broken or cracked.

Many good sized yacht basins have water drums for use in performing a running test of outboards. This type test is ideal as a final check on the engine.

If you don't care to perform a thorough check of your boat's engine, a reliable marine shop will be glad to handle the matter. The point is, you should make certain it is in top running order BEFORE you entrust it with your safety.

*continued*

**The U.S. Coast Guard,** a service never noted for standing short where pretty women are concerned, uses Miss Mary Keller, 19-year-old Glendale, California, girl, as "Miss Boating Safety" model. The curvy young miss helps the Long Beach, California, detachment publicize boating safety courses.

* *See "Basic Tools and Some Emergency Repairs," page 10.*

## BASIC TOOLS AND SOME EMERGENCY REPAIRS

Every boater should have a set of basic tools on board his craft. The kit should include several adjustable wrenches, a pair of slip-joint pliers, a pipe wrench, several screw drivers (both regular and Phillips-head types), a set of box-end wrenches, and a hammer. Also include a spare set of points, a coil, a condenser, and a spare spark plug or two. Keeping an extra fuel pump and a spare fuel filter on board is just extra insurance.

Waterproof tape is very handy, and so is a ball of strong cord. A pocket knife with a strong blade is another good thing to keep handy. Also, don't forget a spare fan belt, and perhaps an electrical system test light, especially if you have an inboard motor.

When you buy tools, get good ones. They cost more to begin with, but they will last for years, and aren't likely to break when you need them the most.

Here are a few emergency repair tips we picked up while visiting the Coast Guard . . .

If the fan belt breaks, and you don't have a spare on board, you can tie a length of rope around the pulleys and proceed slowly to port.

If a fuel or oil line springs a leak, the quickest emergency repair is to bind it tightly with a piece of cloth. This is when that ball of cord comes in handy. A broken line can be temporarily joined with a length of plastic tubing and tightly taped for the slow trip home.

The boater's biggest fear is probably that of losing his rudder. If this happens to you, keep your cool. A jury rudder is pretty easy to rig and will get you home. Tie a bucket or anything else that will create a lot of water drag to a line and pay it out over the stern. As you head for home at slow speed, you can control your direction by moving the line back and forth across the stern.

If your inboard engine springs an oil leak, grab a bucket to catch the oil and pour it back into the engine through the oil filler tube. Things will get messy in the boat, but this trick should keep your engine running long enough, at slow throttle, to get you back to port.

In most cases, you won't be able to travel very fast if you're nursing a sick engine, but the important thing is to get safely back to port. Then you can see about permanent repairs.

If you should ram into something and punch a hole in your boat, you can stuff life jackets, pillows, blankets, or rags into the hole and motor very slowly to shore. Use your emergency signal kit and fire a few flares. This will bring the Coast Guard to your rescue.

Your boat owner's manual has a lot of good info on troubleshooting, so keep it handy all the time.

## FEDERAL REQUIREMENTS FOR OPERATION OF WATERCRAFT

**NUMBERS.** Block type, at least 3 inches high, properly spaced, contrasting in color, and no other numbers on forward half of hull.

**CERTIFICATE OF NUMBERS.** Must be current and on board when the watercraft is in use.

**PERSONAL FLOTATION DEVICES.** Must be U.S. Coast Guard-approved, in good condition, readily accessible, one for every person on board, and for each person being towed on skis.

**FIRE EXTINGUISHERS.** Must be U.S. Coast Guard-approved, in good condition, and readily accessible; for type "B" fires on all watercraft of closed construction using gasoline as fuel.

**NAVIGATION LIGHTS.** Must be displayed between sunset and sunrise when underway; 360-degree, white anchor light, ONLY, to be displayed when anchored.

**BACKFIRE FLAME ARRESTOR.** U.S. Coast Guard-approved, attached to each carburetor; must be clean. May use velocity stocks instead. **Outboards are exempt.**

**VENTILATION.** Must be adequate for each engine and fuel compartment.

**SOUND-PRODUCING DEVICE.** Operator is required to sound navigation signals.

**NAVIGATION RULES.** All watercraft operators are required to know laws governing the maneuvering of watercraft on the water, traffic pattern, right-of-way, and danger zone.

**WAKELESS SPEED.** Extremely slow speed required.

**EXCESSIVE SPEED.** The operator is responsible if the wake from his watercraft causes damage to other property or endangers life.

**INCAPACITATED OPERATOR.** Persons under the influence of narcotics, drugs, or alcohol, or physically impaired, shall not operate watercraft.

**POLLUTION.** Do not throw objects of any type overboard.

**UNSAFE PRACTICES.**

- Improper seating of operator or passengers; **do not sit on backs of seats, or on transom, bow, or gunnels.** Keep your center of gravity low in boat.
- Speeding at night, during limited visibility, in congested areas, and in rough water.
- Operating in proximity to persons or other boats in the water.
- Drag racing.
- Overloading.
- Careless operation of skier.
- Operating with no observer.

**CASUALTIES.** Report all accidents or casualties of any type immediately to the nearest law enforcement agency.

(Courtesy U.S. Coast Guard)

**Hull rollers** on the trailer should be oiled and adjusted to fit the hull's contours.

**Correct pressure** in the trailer tires is vital to safe towing. Use an accurate gage.

**Check the trailer lights**—all of them—for operation and compliance with state laws.

If your boat has batteries, give them a thorough going over. If they have been in storage, have them put on a trickle charger after the battery fluid level is checked. Then analyze each cell with a hydrometer. Replace the battery if you find a dead cell.

Clean the battery cables and connections before you reinstall the battery. A coating of petroleum jelly on the terminals AFTER the cables have been connected will help discourage corrosion.

### BOAT TRAILER TIPS

Now that your boat is ready to go, is your trailer ready to roll? You won't go wrong if you pull the wheels and repack the bearings with the right type of grease. Experienced boaters say the wheel bearings should be repacked at least twice a year, especially if you launch your boat in salt water. If your trailer doesn't have waterproofed wheel

bearing assemblies, having them installed will save you money and grief in the long run.

The winch and launch line should be in top condition; and, if you use a power winch, it should be rigged for hand operation. Otherwise, what would you do if your car battery were to fail at the critical moment?

The boat rollers should be oiled and properly adjusted to fit the hull, and the tiedowns should be long and strong. You can get an awful sinking sensation in the pit of your stomach if you glance up into your rearview mirror and discover your boat skidding along the highway.

Are your trailer and car hitches OK? A load-equalizer car hitch is the best kind.*

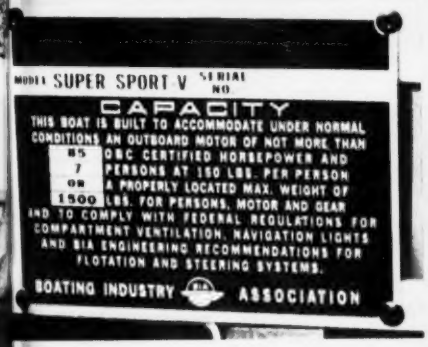
Proper tire inflation on your trailer is really important. A soft tire can cause the trailer to swing and sway dangerously.

Be sure your trailer lights, brakes, and registration meet the requirements of all the states where you plan to go boating.

When you have completed the preseason maintenance on your boat, let the Coast Guard Auxiliary know and they will be happy to give your boat and its equipment a complimentary inspection. There's no obligation on your part, and they do *not* make any report of discrepancies they might find. This is simply a free service for all boaters—and it's a good way to find out if you have missed anything important.

Next month, we'll talk more about personal flotation devices and how to launch your boat, and will give some Coast Guard tips on safe boating and other good things. ●

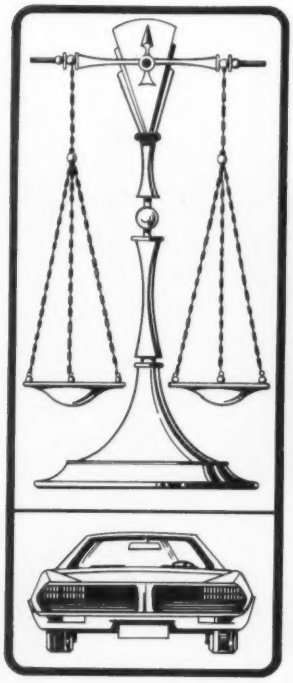
* *See "Rec Vehices Are Fun," Apr '73 DRIVER.*


MODEL SUPER SPORT V
SERIAL NO
CAPACITY
THIS BOAT IS BUILT TO ACCOMMODATE UNDER NORMAL CONDITIONS AN OUTBOARD MOTOR OF NOT MORE THAN
85
OR
1500
OBC CERTIFIED HORSEPOWER AND
7
PERSONS AT 150 LBS. PER PERSON
A PROPERLY LOCATED MAX. WEIGHT OF
LBS. FOR PERSONS, MOTOR AND GEAR
AND TO COMPLY WITH FEDERAL REGULATIONS FOR COMPARTMENT VENTILATION, NAVIGATION LIGHTS AND BIA ENGINEERING RECOMMENDATIONS FOR FLOTATION AND STEERING SYSTEMS.
BOATING INDUSTRY ASSOCIATION

**The capacity plate** is your best guide to the boat's maximum safe horsepower rating and weight-carrying capacity. When figuring the max load your boat will be carrying, add 100 pounds to the total passenger weight. That will give you a safe margin for additional gear.

Insurance through an unscrupulous auto dealer is bad news

# the LAW and the AUTOMOBILE



by Lt Larry S. Craig
Asst Legal Officer
11th District, U.S. Coast Guard

It is a common experience with many servicemen, particularly in the lower pay grades, to purchase a used car from sometimes unscrupulous car dealers who make complicated financing arrangements. These "deals" virtually always stretch the serviceman's finances very thin.

While much has been done in the area involving misrepresentation of financing charges, such as that effected by the Federal Truth in Lending Act, the serviceman often does not understand the *insurance aspects* of his purchase; he is frequently under the erroneous impression that his insurance coverage is broader than it actually is. The following theoretical situation highlights the danger in such lack of understanding.

A young serviceman decides to buy a particular automobile. With $100 or $200 down, and monthly payments, the car will be "his." Further, the salesman tells him the monthly payments are set up to "include insurance." Since insurance is a virtual necessity for operating a vehicle, this appears to the unsuspecting customer as a pretty good deal. Also, since he is in the category of those who are charged fantastically high premiums, this appears to be the best way to have the car and also have insurance. So he makes the plunge.

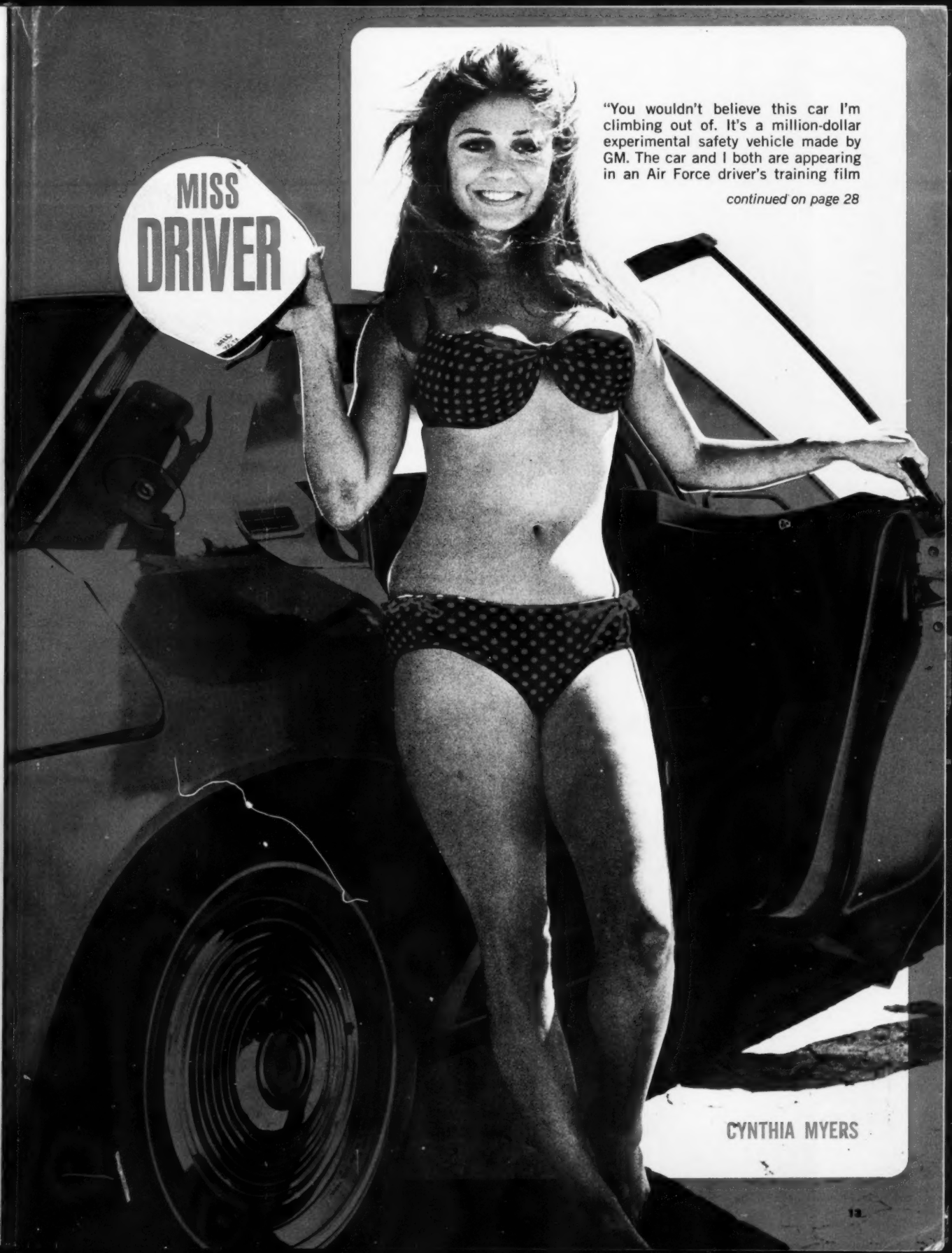
The serviceman, however, does not always realize that often the insurance policy thus written covers "collision only." This means that if the automobile is wiped out in an accident, the insurance company will pay the actual cash value of the car to the *financing company*, not to the "insured." The serviceman's personal liability for damage to the other car, or for injuries to occupants of either car, is *not covered* by the "collision only" policy.

The effect is that, when the serviceman who carries only this type of "collision" insurance is at fault, his insurance will pay his financing company, *only;* the individual will be left owing the finance company any balance not covered on his loan as well as the other driver for damages to his car and for any personal injuries caused.

It *is true* that there are some things that can be done by a legal assistance officer to help the serviceman in such a situation. But that "help" usually extends only to lessening the immediate impact, and rarely can the serviceman totally escape personal liability. The Soldiers and Sailors Civil Relief Act of 1940 does not make the serviceman immune from lawsuit or judgment. Even though a court may stay the execution of such a judgment, the fact of liability will remain; and, in most states, it may be renewed periodically. When the serviceman returns to civilian life, the judgment may be executed.

The only real protection is to foot the bill for adequate insurance coverage, including personal liability and property damage as well as collision insurance on the vehicle he drives. It is a very good idea to shop around with various insurance companies for quotations of rates.

In some cases the serviceman might pay the same amount of money (premium plus high finance rates) for the "collision only" insurance that he would pay for full coverage; and, even if he had to finance the premium through a credit union loan (at lower interest rates) he would be much better off. ●




"You wouldn't believe this car I'm climbing out of. It's a million-dollar experimental safety vehicle made by GM. The car and I both are appearing in an Air Force driver's training film

*continued on page 28*

CYNTHIA MYERS

# WHAT SHOULD YOU DO?

**You're in the right lane passing through a business district and traveling at 25 miles per hour. You're going downhill, approaching a traffic signal that has turned red, and discover your brakes are gone. Vehicles are crossing in front of you in the intersection, and you can't stop. What should you do?**

**A. Sound horn, pump brakes, downshift, set parking brake, and rub tires against and into curb to stop.**

**B. Pump brakes, down-shift, set parking brake, and turn right at the intersection.**

**(See answer on page 15)**

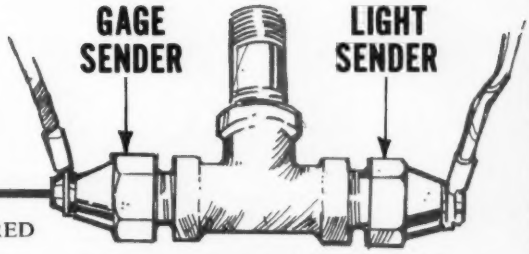
# NEW BRITISH HELMET LAW

If you ride a motorcycle, scooter, or moped in England, you MUST wear a safety helmet. This new rule became effective 1 June '73, and should be of interest to motorcyclists assigned to England or planning to tour there.

The types of helmets worn must comply with British Standards, or with a comparable national standard, such as the United States' Z90.1 and/or Snell Standards.

Riders or passengers who fail to comply with the new rule are liable to a fine of up to 50 pounds ($120). For DRIVER readers, there's no worry in this department. We all wear helmets every time we ride our bikes —right? *RIGHT!* ●

# TIP OF THE MONTH




## "IDIOT LIGHTS" RECONSIDERED

The first thing some people do when they get a car is replace those "worthless idiot lights" with a set of groovy gages. Gages allow you to monitor engine condition all the time. Lights, on the other hand, don't do anything until something drastic happens.

But there's something else to think about here. What happens when you get out of the habit of scanning the gages, or your girl is driving your machine and it loses oil pressure, or starts to overheat? No flashing lights come on to warn of impending disaster, because the light senders were removed to install the gages. Your engine could just about munch itself before you (or she) would be aware that anything was funny under the hood.

Well, there's a way to have the best of both worlds, so to speak. You can add gages, yet retain the lights to grab your attention when it's needed. Here's how:

For the oil pressure gage, remove the stock sender from the block and install a short piece of pipe with a pipe T attached to it (Fig. 1). Screw the stock sender to one end of the T-fitting, and the gage sender to the other end, sealing the threads with pipe sealer—now you've got a gage *and* an "idiot light."

The water temp gage may be a little trickier to rig, since it has a sensor bulb which must extend into the coolant. In most cases, there's a spare hole in the intake manifold or water pump where the additional sender can be inserted when the plug is removed. If not, you should be able to use the stock hole to install a fitting with a T long enough to combine the senders, as with the oil pressure hookup.

An amp gage has no sender; just install the gage per instructions, and you'll automatically get the benefits of both systems. ●

(Adapted from an article by R. C., Jun '73 HOT ROD magazine)

# REC VEHICLE TIRE CARE

Over four and a half million rec vehicles of all kinds and sizes are on the roads these days, and each one needs special tires and tire care, says the Tire Industry Safety Council.

"A motorist shouldn't rely on the rule-of-thumb he applies to his car for tire maintenance and safety procedures when choosing and using his rec vehicle tires," the Council advises.

Rec vehicle owners can get a free copy of "A Recreational Vehicle Consumer Tire Guide to RV Tire Care" by writing to "Recreation," Box 726, New York, NY 10010, and inclosing a stamped, self-addressed, business-size envelope.

Two of the important rec vehicle tire care items included in the free guide are: inflation and allowable loads. ●

# ANSWER TO "WHAT SHOULD YOU DO?"

(See page 14 before reading)

This is a hairy one, and you have to think and act fast. Your best decision is to sound horn, pump brakes, downshift, set parking brake and rub tires against and into the curb to stop. The combination of the tire and curb friction, plus the parking brake drag and down-shift should get you stopped. Anything is better than going into that intersection, even rubbing along cars that might be parked on your right. If you see that you are not going to stop in time, throw the car into Park or Reverse. This may ruin your transmission, but it could keep you out of that intersection. ●

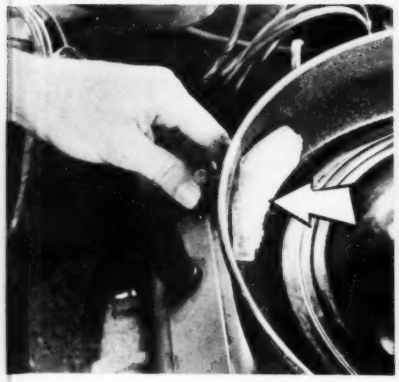
# THE BACK-YARD MECHANIC-- Part VII

# emission control devices

**(This article compiled, in part, from information provided by Capt William M. Peoples, Hq Central Air Force Reserve Region (AFRES.)**

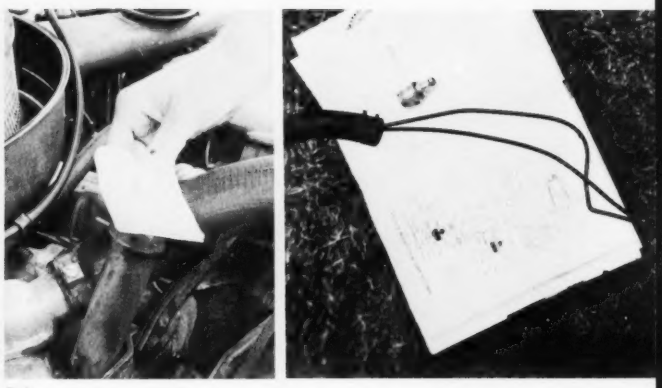
*Note: Department of Defense components have been charged with the responsibility of "leading the way" in USAF vehicle emission pollution abatement. Military units desiring specific information on emission control should contact Capt William M. Peoples, Chief, Transportation Div (TSLT), Directorate of Logistics, Hq Central Air Force Reserve Region (AFRES), Ellington AFB TX 77030.*

**Illustrated above is our artists' concept of the ultimate pollution control device, a knot tied in the tailpipe during a stage-one smog alert.**



1-2

**To check** a closed PCV system, first pull the air supply hose loose at the air cleaner. Be careful not to damage the special filter (arrow) to which it usually attaches. With the engine idling, a slight pull or vacuum at the end of the hose means the system is operating properly. An absence of vacuum indicates a plugged system.



3-4

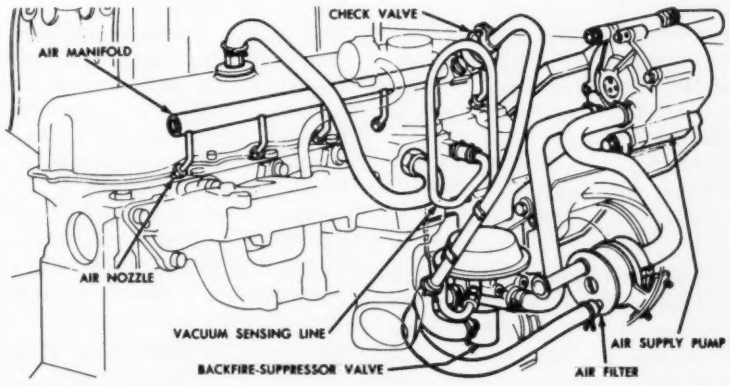
**Place a piece** of paper on the oil filler tube (with the cap removed). If the paper is sucked against the tube (with the engine idling), the air hose is plugged or leaking. Clean a plugged hose with PCV solvent and a straightened coat hanger. Replace a leaking hose. If the paper still is not sucked against the tube, the PCV valve is probably plugged.

Air pollution has been around a long time—much longer than the automobile. But today, auto emissions are largely responsible for the polluted air in many cities. And, the internal-combustion engine produces most of the hydrocarbons and nitrogen oxides which create the harmful photochemical* "smog" peculiar to southern urban areas.

Large-scale efforts to control automotive emissions and the resulting smog began in the early '60s, with installation of the Positive Crankcase Ventilation (PCV) system on all new cars.

The now universal PCV system proved to be effective, reducing the average vehicle's daily hydrocarbon emissions from an estimated 1.25 pounds to about 1 pound. This reduction, however, had little effect on the smog problem because of the yearly increase in the number of motorized vehicles.

Several more control devices, designed to further reduce the emission levels of each car, have been added during the last 7 years. Engine design changes such as reshaped combustion chambers, as well as altered tune specs, have also been implemented to help control the auto's smog-producing byproducts. These devices and adjustments have reduced emissions considerably.




This diagram shows the various units of an AIR system on a six-cylinder engine, using a by-pass type backfire-suppressor valve.

Fig. 1

By 1968, automotive emission control devices were preventing 500,000 gallons of hydrocarbons and 2,400 tons of carbon monoxide from entering California's air *each day*. Along with reducing emissions, however, smog controls continue to sap engine performance and economy, making them very unpopular with many people.

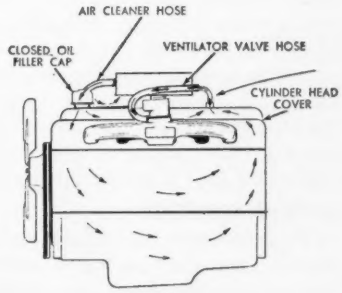



Fig. 2

## DO YOURSELF A FAVOR

Despite your feelings about emission controls, however, they do work; they are necessary, and will be with us until there is a technological breakthrough. Your car is designed to operate with its pollution control systems working. So, you'll be doing yourself, your car's engine and your environ-

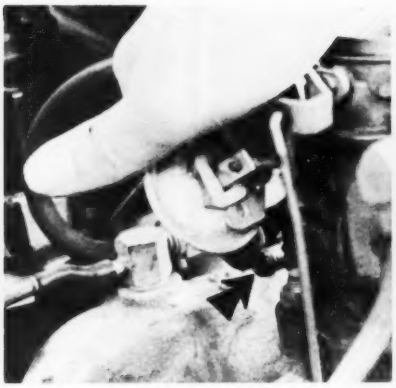
*continued*

**Smog is formed when sunlight causes hydrocarbons and nitrogen oxides to combine in a photochemical reaction. "Smog" originally referred only to photochemical air pollution found in sunny southern cities. The term is now generally used to refer to air pollution in any urban area. This usage will apply in this article.*

**Permission to reprint Fig. 1 courtesy Cowles Education Corp, Copyright 1968 by Harold T. Glenn.**

5

**Pull the valve** loose from its grommet and shake it. If it doesn't click freely, replace it. If the valve clicks, check for vacuum at the end of the valve (with the engine idling). If none, the hose between the valve and carburetor vacuum passage is probably plugged.



6

**Pull the hose** loose from the base of the carburetor (arrow). With the engine idling, suction at the vacuum fitting means the hose is plugged and should be cleaned or replaced. The carburetor vacuum passage will have to be cleaned if there is no suction at the fitting.

7

**Cleaning** the PCV valve regularly and replacing it yearly are essential to keep the ventilation system operating at top efficiency.

continued



ment a favor by keeping these systems properly maintained. And, driving with a disconnected or otherwise inoperable smog device is illegal, as well as harmful to your car's engine in most cases.

### SMOG DEVICES NOT REALLY THAT COMPLEX

You can perform general operational checks, and do most (if not all) of the regular emission system maintenance easily at home. All you'll really need, in addition to a couple of common tools and a few mintues, are a can of automatic choke cleaner and some PCV solvent (available for less than $2 each). Even if you perform these services while your car's emission systems are under warranty, the car should be taken to a certified mechanic to keep the warranty in effect. However, performing the regular maintenance shown here and in your manual, before taking the car in, can reduce the cost of the required visits.

### SEVEN BASIC SYSTEMS

There are seven basic types of emission controls used on American cars today. The operation and maintenance procedures for all seven types will be generally discussed in two parts, in the order in which the systems were adopted by the auto industry. This will give you a general knowledge of the types your car uses, and what maintenance is required. Procedures differ between cars, however, and a service manual should be consulted before performing any such maintenance.

### VENTILATION SYSTEM

Crankcase blowby* gases were the first automotive emissions to be controlled, with the adoption of the aforementioned Positive Crankcase Ventilation system. The PCV system was introduced to take the place of the road draft tube which vented unburned gases from the crankcase, directly into the atmosphere.

The PCV system reduces hydrocarbon emissions by circulating fresh air down through the crankcase to pick up the blowby gases. These gases are then re-routed through the carburetor and into the combustion chamber and burned before being expelled into the atmosphere through the exhaust (Fig. 2).

### PCV VALVE IMPORTANT

The well-known PCV valve is the heart of crankcase ventilation. It is simply a spring-loaded device which regulates the flow of blowby gases according to engine speed and manifold vacuum. However, carbon and gunk deposited by the blowby gases will eventually clog the PCV valve and/or system hoses, and the gases cannot flow to the carburetor for burning. When this happens, your engine will run very poorly and spew out additional pollutants.

If the system becomes completely plugged, the blowby gases trapped in the crankcase will dilute the oil and cause excessive oil burning and engine wear. And, over a period of time, the pressure built up in the crankcase can be enough to blow engine seals and cause serious oil leaks.

Servicing your car's PCV system can be done quickly and easily, however, and prevents such problems. The entire operation takes only a few minutes, but it does require a little more than just shaking the PVC valve.

The best time to check out the PCV system, as well as doing most emission system work, is when you change the engine oil. Checking the systems this frequently will help ensure they are operating.

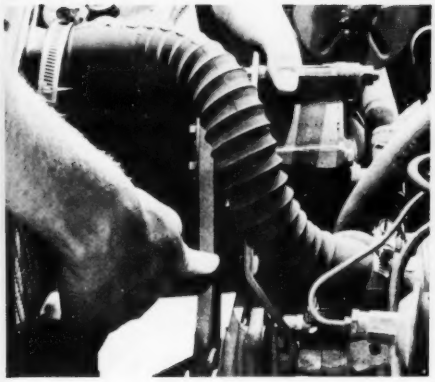
### TWO TYPES OF PCV SYSTEMS

There are two types of PCV systems in use today. The open system, which was used on most pre-1968 cars, draws its fresh air supply through a filter inside the oil filler cap. The more common closed system, installed on nearly all cars since 1968, draws its air supply from the air cleaner by way of a hose linking it and the oil filler cap (or sometimes the rocker arm cover). Other than routing of the clean air, the two systems are identical and the check procedures are basically the same.

### CHECKING CLOSED SYSTEM

On a closed system, the first step is to check for suction at the fresh-air hose, which runs from the air cleaner to the oil filler cap. Pull the hose loose at the air cleaner, after removing the air cleaner top to see if the hose is

**Unburned gases forced past the piston rings and into the crankcase during combustion.*



8

**The air injection** pump's drive belt must be in good condition and properly tensioned for the pump to deliver the required amount of air.

9-10

**Remove the** air delivery hose at the distribution manifold (on the exhaust manifold). With the engine idling, air should flow from the hose. If the flow increases when the engine is fast idled, the pump is working correctly. The check valve (arrow) should also be tested when the delivery hose is removed. Depress the valve plate (inside the valve), then release it. If it doesn't pop back to its original position, replace the valve. A V-8 engine has a valve at each manifold, and both should be checked.

attached to a filter.

If your car uses such a filter, be careful not to break the molded fitting when pulling the hose loose. Clean or replace the filter as required. The molded filter units are available for less than $1 at most parts or discount houses.

With the engine idling, place your thumb over the end of the hose. You should feel a slight pull or vacuum, indicating air is being drawn all the way through the system. If so, the system is operating properly. Locate the PCV valve (usually in the rocker arm cover, or in the intake manifold) and clean it, following the procedure given later.

If there isn't any vacuum at the end of the hose, the system is plugged. Remove the oil filler cap and cover the filler tube with a piece of paper. If the paper is sucked against the tube with the engine idling, the hose between the air cleaner and filler cap is plugged. Clean the hose by running some solvent through it and pulling a clean cloth through the length of hose. A straightened clothes hanger will serve as a cleaning rod.

Although the air hose sometimes plugs on older cars, plugging of this hose is fairly rare. If there is an absence of vacuum at the air hose, there will usually be little or no vacuum at the filler tube, indicating that the PCV valve is probably plugged.

Locate the PCV valve, pull it carefully from its rubber grommet, and shake it. If it doesn't click freely, install a new valve. If the valve clicks, it's OK. In that event, either the carburetor vacuum passage or the hose between it and the PCV valve is plugged.

Trace the hose from the PCV valve to the carburetor and pull it loose from its fitting. With the engine idling, place your finger over the fitting. If you feel vacuum, the hose is plugged and needs to be cleaned (using the procedure given previously) or replaced. If there is no vacuum at the fitting, the carburetor vacuum passage is plugged and must be cleaned out. This job usually requires removing the carburetor, and is best left to an expert.

### CHECKING OPEN SYSTEM

Checking an open PCV system is basically the same, except that the first step is removing the oil filler cap and soaking it in solvent to clean the mesh filter inside. Then proceed to the paper-on-the-oil-filler-tube check. If there is vacuum at the filler tube, the system is open—just clean the PCV valve. If there is no vacuum at the filler tube, check the valve, hose, and carburetor vacuum passage as previously explained.

### CLEANING VALVE

Cleaning the PCV valve should be done each time the system is checked, to keep it operating at top efficiency. However, the valve should be replaced at least once a year, regardless of its condition, or if it is plugged. Since a new valve costs less than $2, it's not worth your trouble to try and clean a plugged valve.

While various solvents can be used to keep the valve clean, a can of PCV solvent with a spout end, or an aerosol can of automatic choke cleaner, works best. Insert the spout end (or a small screwdriver if you're using an aerosol spray) into the end of the valve, and work the valve's spring plunger in and out, squirting in a few shots of solvent.

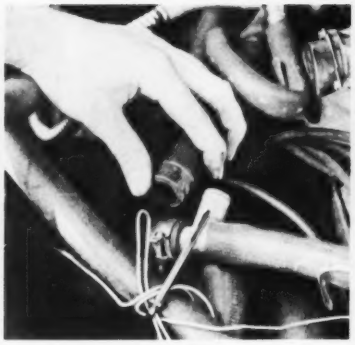
Start the engine and let it idle as you work more solvent into the valve. Reinstall the valve, and let the engine run a few minutes to evaporate the solvent.

### AIR INJECTION SYSTEM

The exhaust emission problem was the second area to be attacked in the fight against smog. Air injection systems designed to further reduce hydrocarbon emission were introduced in California in 1966-67. These devices, which provide for more complete combustion of exhaust gases, were adopted nationwide the following year. Air injection systems have been eliminated on some newer models, but many cars have this system.

There are several types of air injection systems (known as the "A.I.R." system on General Motors cars, and as the "Thermactor System" on Ford products), but they all operate in essentially the same manner. A belt-driven pump supplies air to an injection, or air distribution manifold (mounted on the exhaust manifold), which has a nozzle positioned behind each exhaust valve. Oxygen-rich air is injected into the exhaust manifold to combust unburned hydrocarbons before they are expelled as exhaust.

*continued*



11-12 **The anti-backfire,** or bypass valve, is an important component of the air injection system. Locate the valve and the vacuum line which runs to it (arrow). Trace the air hose which runs from the check valve to the T-fitting near the valve. Pull the hose loose at the fitting. With the engine idling, air should flow from the fitting. Pinch off the vacuum line for about 5 seconds, then release it. If airflow from the hose doesn't diminish, replace the valve.

13-14 **Replacing** the air filter every 12,000 miles is the most common air injection system maintenance. Many systems, however, draw air from the carburetor air cleaner, and do not have a separate air cleaner.

continued

## THE BACK-YARD MECHANIC

In addition to the air pump, the essential parts of the injection system are an anti-backfire device and a check valve to prevent exhaust from backing up through the system (Fig. 1).

### FEW PROBLEMS

Properly installed and adjusted air injection systems are quite reliable, and seldom cause problems. However, a malfunctioning system can cause engine surge, backfiring, and overheated spark plugs, as well as *increased* hydrocarbon emissions. So, a quick check at the same time you inspect the PCV system is well worth the effort.

The air pump is the most critical part of the air injection system, and is the first item to check. The pump is usually located in front of the engine, and is driven off the pulley that drives the fan. Although the pump rarely malfunctions, its drive belt can slip or break. Replace the belt if it is cracked or frayed, and be sure it is properly tensioned—generally about ½-inch of play between the pulleys.

### AIRFLOW

Proper air delivery from the pump is essential to the injection system's operation. To check for airflow, trace the air hose from the pump to the air distribution manifold(s) (a 6-cylinder engine has only one, whereas a V-8 engine has one for each cylinder bank). Remove the hose at the manifold.

With the engine idling, there should be a constant flow of air from the hose. If the airflow increases when you fast-idle the engine, the pump is OK. If the airflow is insufficient, the pump's air filter may be clogged or the pump will probably have to be replaced.

### CHECK VALVE

To prevent exhaust gases from backing up through the system, special check valves are used. These valves are usually located at the air distributor manifolds, but may be installed in the air hose. Operation of these valves should be checked regularly, since they occasionally malfunction (some manufacturers recommend regular replacement of these valves—check your manual).

Disconnect the air supply hose at the valve. The valve plate should be positioned against the valve seat (in the up position in most cases) away from the air manifold. Depress the plate with a screwdriver and release it. If it doesn't pop back to its original position, replace it. It should also be replaced if exhaust escapes from the valve with the engine idling.

### ANTI-BACKFIRE VALVE

Another special device is used to prevent backfire during deceleration. There are two types of anti-backfire systems used, but the bypass, or anti-backfire valve, is used on most cars. The bypass valve is designed to divert airflow from the pump to another source when the engine is decelerated. This temporarily leans outs the fuel mixture, providing better combustion and eliminating deceleration backfire.

To test the bypass valve, trace the hose which runs from the air manifold check valve to the T-fitting near the bypass valve. With the hose removed at the T-fitting, and the engine idling, air should flow from the fitting. To simulate deceleration conditions, pinch off the vacuum line which runs to the anti-backfire valve (see picture).

Release the vacuum line after about 5 seconds. If airflow from the fitting does not diminish, replace the valve.

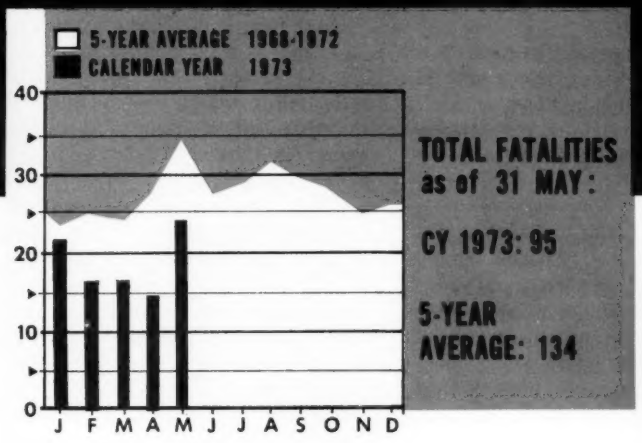
### AIR FILTER

Other than periodic inspection and/or replacement of the check valves, the only regular maintenance your car's injection system will probably need is replacement of the system's air filter. This should be done every 12,000 miles on systems fitted with external filters. Most of these units use replaceable filter elements which are replaced by removing the locking nut, installing the new filter, and reinstalling the nut.

A few units use a rotating air filter inside the air pump. These filters are sometimes tricky to replace, so check your manual for the correct procedure. Most of the newer systems draw air from the carburetor air cleaner, however, and replacing this filter every 12,000 miles takes care of both jobs.

### NEXT MONTH

Hopefully, you're already convinced of the value of properly maintaining your car's emission systems. So, next month we'll jump right in with the thermostatic air cleaner system, and bring you up-to-date on all emission control systems installed through model year '73. ●




**TOTAL FATALITIES as of 31 MAY:**

**CY 1973: 95**

**5-YEAR AVERAGE: 134**

A monthly recap of selected accidents—presented solely in the hope some will benefit from the unfortunate experiences of others

# HOW GOES IT?

## 100-MPH ROLLOVER

**Rank: Capt Type vehicle: 1968 Pontiac Firebird**

After visiting at the club for about 5½ hours, upon completing a tour of duty, the Captain departed for home in the Firebird. When he lost control at an estimated 100 mph, the auto veered off the right side of the highway and into a shallow ditch. The vehicle's front-end dug into the dirt at the intersection of a county road, became airborne, flipped three times, and ejected the driver. The car then rolled over from side-to-side and came to rest, upright, 75 feet from the Captain's body.

Seat belts and shoulder harness were installed, but not in use. In the opinion of the investigators, use of the restraints would have prevented the driver's death.

**Probable cause:**
Loss of control at high speed.

**Possible contributing factors:**
Alcohol and fatigue. Also, use of the restraining devices might have assisted the driver in retaining control.

## "ALCOHOL INVOLVED"

**Rank: SSgt Type vehicle: Suzuki 550cc motorcycle**

The SSgt was operating his bike on a winding, two-lane, black-top road at night. The road was dry, the weather fair, and there was no other traffic. He was properly dressed for riding; wearing a helmet, gloves, boots, and a parka, but was fatally injured when he failed to negotiate a curve.

The vehicle departed the roadway, struck a small dirt knoll, and overturned, end-for-end. The rider was ejected, and came to rest 10 feet from the motorcycle.

The accident report read: "Alcohol involved."

**Probable cause:**
Failure to negotiate curve.

**Probable contributing factors:**
Alcohol; speed too fast for winding road at night.

## FATAL FATIGUE

**Rank: MSgt Type vehicle: 1971 Volvo 4-door**

The MSgt had told his buddies he was tired, several hours preceding the accident. Approximately 500 feet from the accident scene, the road was gradually narrowed by construction barriers to guide traffic left for a two-lane bridge crossing. The right half of the bridge was closed off for repairs. The barricade was equipped with amber lights and warning signs for 1500 feet leading to the bridge.

The sleepy MSgt drove into the barricaded area, which was posted at 25 mph, at an estimated speed of 55 mph, at 0330. The vehicle crossed the road and struck the left side of the bridge, and the driver's side of the car was demolished. The car then crossed the road again, and came to rest against a timber barrier. The driver's body was found on the ground beside what remained of the left front door.

At that speed in a side-crash, the installed seat belt and shoulder harness may not have prevented death; but, had he been buckled in . . . and wide awake, he might have retained control of the car.

**Probable cause:**
Loss of control while speeding in construction zone.

**Contributing factors:**
Fatigue and failure to use restraining harness.

## MOTORCYCLE vs TRAIN

**Rank: Sgt Type vehicle: 1971 Triumph 650cc motorcycle**

The Sgt drove his bike past a RR grade-crossing warning sign and pavement markings at 55 mph, during daylight, and commenced braking 130 feet from the tracks.

The machine skidded and collided with a wheel of a switch engine that was traveling 18 mph. The Sgt, who was not wearing a helmet, sustained fatal injuries when his head impacted the switch engine's wheel.

**Probable cause:**
Failure to slow at warning sign and pavement markings.

**Probable contributing factors:**
Inattention; speed.

## SHORT SHORT STORY

**Rank: SSgt (Pedestrian)**

The SSgt walked onto a busy autobahn to rescue an injured pheasant, and was killed by a car traveling 75 mph.

**Cause:**
Walking on traveled road.

Have you ever known a guy who could sit behind a steering wheel and concentrate on nothing but his driving? I mean stay totally involved with driving—nothing else. If you have, you probably know someone who is a pro driver, has superhuman powers of concentration, is blissfully stupid—or has never driven with his girl in the front seat!

Let's face it, driving's not always an exciting challenge. In fact, it frequently seems deceptively routine. And when most of us have to do something routine, our minds occasionally wander—even daydream a bit. Instead of boring ourselves with what's at hand, we think about more interesting things; like girls, parties, cars, the weekend, or anything that might *seem* to be more important at the moment.

So it's not unusual that most of us don't always give driving our undivided attention. And because we don't, it's also not unusual that we occasionally get caught not paying attention—and nearly kill ourselves. Like a time back when . . . let's see now . . . .

As I recall, it was one of those Fridays; the kind that comes at the end of a long, hard week when you've lost a lot more than you've won . . . when all you want to do as you drive home is *not* think about work.

Well, I'd just survived another Rush Hour Grand Prix, turned off the freeway, and was merging into a stream of slow-moving traffic. A most welcome change of pace, all things considered.

As I maneuvered into a left-hand lane and stopped behind some cars waiting for the arrow, I noticed what a beautiful, warm day it was. My thoughts drifted back to a rag-top sports car I'd owned a few years ago . . . what super top-down weather. . . .

When the arrow turned green, I followed the cars ahead onto a four-lane highway leading out of town, then moved over to the right-hand lane. Everyone was moving out at a pretty good clip when, off to the right, I caught a glimpse of our local newspaper office.

I'd been meaning to stop by there . . . maybe if I came this way tomorrow, I could. . . .

# DRIVING SPACE

As I looked back at the road, there, right in front of me, was this giant car —*stopped dead!*

I yanked the wheel hard left, mashed the brakes, and thought, *"This is it!"* But in the next few seconds, my faithful subcompact (bless its oriental heart) miraculously twisted through two seemingly impossible right-angle turns and wound up in the left-hand lane, headed in the right direction—looking as innocent as the Godfather in church!

You might say I was lucky, and perhaps I was; because, like so many other usually safe drivers, I'd let routine lull me into a potentially fatal scene. But I would like to think it wasn't *all* luck.

I "knew" it was clear behind, and that the left lane was empty because I had something "extra" going for me. Something all thousand-miles-a-month, "real world" drivers need. Something to give you an edge when routine sets in and you get caught not paying attention. Something extra like "The Smith System."

"The Who's what?" you ask.

No, it's not something that belongs to a rock group. It's something belonging to Driver Behavior Specialist Harold Smith.

"So who's he?"

Good question. Unless you're familiar with the safety side of the transportation industry, or have worked with one of the nation's major fleet operators, chances are you don't know about the Harold L. Smith Driver Improvement Institute or Smith's five keys to Space Cushion driving.

Now don't rush off; this isn't another one of those run-of-the-mill defensive-driving pitches.

On the contrary, instead of defensively relying on catch-as-catch-can reactions to the unexpected, as most driving methods do, the Smith System is a *positive* plan you can make part of your personal driving pattern.

That's the big difference—it's *positive*. You don't wait until tires are screeching to use it; you apply it all the time. That, and it's also simple, which makes it easy to remember!

Now, if you have about 2 minutes and 30 seconds, I'll briefly describe the Smith System by explaining its five short keys to Space Cushion driving.

### AIM HIGH IN STEERING

Have you ever noticed that, as you walk, your eyes are naturally inclined to look about 25 feet ahead of your toes? Well, the same goes for driving.

When you aim high in steering, by glancing quickly and frequently well ahead at the center of your lane, your car will tend to travel on-center with

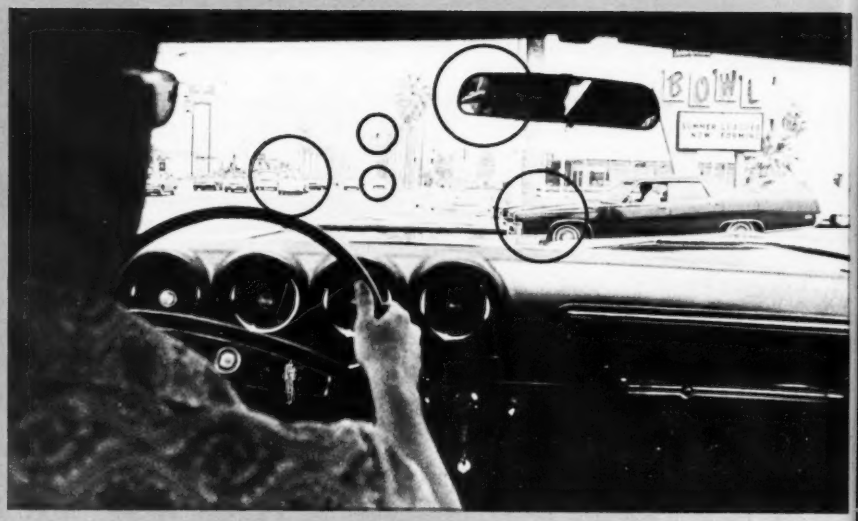
*continued*

# D OUT

by DON BINDER

**KEY TWO: GET THE BIG PICTURE.**

**KEY THREE:**
**KEEP YOUR EYES MOVING.**




continued

## DRIVING: SPACED OUT

no need for excessive corrective steering.

### GET THE BIG PICTURE

To get the big picture, simply look at the area you intend to drive through. Check it a full city block ahead, and from the sidewalk or shoulder on your left to the one on your right. Also glance at your rear-view mirrors frequently, so you'll know what's going on back there.

Incidentally, getting the big picture will be easier if you divide everything you see into either "ground" or "objects." "Ground" for this purpose, includes anything that won't move. "Objects" include everything that can either move or affect your car's movements, including such things as traffic signs and lights.

Now, once you can compute everything in the big picture, stay a good safe distance from whatever you're following so that you can comfortably ignore the vehicle up front, while you glance ahead. (Especially when there are a lot of "objects" in short summer dresses!)

### KEEP YOUR EYES MOVING

No pun intended with this title following that last remark, but it's a fact that normal eyes have only a 3-degree cone of sharp, central vision. And it's in that very small cone that you actually see objects in great detail. Consequently, when your eyes stop to focus on one thing, you really can't see anything else clearly, although you may think you can.

For example, let's say you're driving along in the right-hand lane next to some parked cars. You see a driver sitting in one and ask yourself, "Is he going to pull out, or is he going to stay? Is he going to open the door and get out, or just sit there until I've passed him? Or will he wait to do something just about the time I get there?"

In the time it would've taken you to think about all that, you'd have been staring at that guy for about 3½ seconds. And a 44 feet-per-second you'd have traveled 154 feet down the roadway—having really seen nothing else *clearly!*

In other words, while you "focused" on that "object" you'd have completely lost everything else in the big picture.

So, the point of all this is, as long as your wheels are turning, keep your eyes moving.

### LEAVE YOURSELF AN "OUT"

As hunters read animal tracks to understand game, we can read skid marks to learn about accidents.

When we see black marks leading to a pile of glass, we know a driver had his foot on the brake pedal before the crunch. And, from this, we know he had allowed his wheels to get ahead of his eyes.

This won't happen to you, if you always anticipate an accident ahead and make sure you have enough room around your car to avoid it.

### MAKE SURE THEY SEE YOU

Eye contact is your best indication that the other guy knows you're there, *and* has a reasonably good idea of your intentions.

Your horn is your primary tool for gaining eye contact with other drivers as well as pedestrians. You can revive the lost art of properly using the horn by honking in a friendly way.

Then, at night, you can flick your high beams, in a friendly way, to get the attention of the driver or pedestrian ahead. And you can warn the drivers behind with your brake lights by softly tapping the brake pedal, activating your turn indicator, or even using a hand signal.

Well, that's it! AIM HIGH IN STEERING, GET THE BIG PICTURE, KEEP YOUR EYES MOVING, LEAVE YOURSELF AN "OUT," AND MAKE SURE THEY SEE YOU. Those are the five basic

**KEY FOUR:**
**LEAVE YOURSELF AN "OUT."**

**KEY FIVE:**
**MAKE SURE THEY SEE YOU."**

keys to the Smith System.

There is, of course, much, much more to Space Cushion driving as Harold Smith teaches it. This is simply what's stuck in my memory over the years and become part of my driving pattern.

"But wait a minute!" you say. "If you use the Smith System, then how come you nearly rear-ended that guy?"

Another good question. And one that causes me to squirm a bit, I might add. Because the truth is, when that incident happened, the Smith System was working for me in a way not recommended by Hal Smith—or me either!

You see, although I wasn't aware of it, from force of habit I'd checked the big picture behind me before I "focused" on that newspaper office. So, when I finally saw that stopped car, I subconsciously knew that no one was coming up behind me in the left lane and it was clear for me to use as an "out."

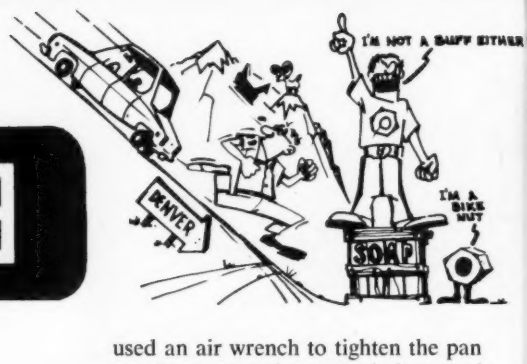
And speaking of that stopped car, this is the end of that story.

When I finally got around that guy, I slowed and saw why he was sitting so meekly in the middle of my lane.

There, stopped right in front of him, was a police car!

And there, in front of the police car, running helter-skelter along the side of the road, was a tiny, brown puppy. And there, trying desperately to catch that ball of fuzz, was a very little boy!

I was shocked. It looked like a scene from a how-not-to-do-it safety movie. If fact, as I drove by, I thought to myself, *"Somebody should write this up for DRIVER magazine.* Now, if I could think of some way. . . ." ●




# BACKFIRE

**Address your letters to:**
**Editor**
**DRIVER Magazine**
**SEDD**
**Norton AFB CA 92409**

## A FEARFUL SIGHT

A car traveling down the road backwards and completely out of control is a fearful sight, and an all too familiar one in this area.

Since arriving in the Denver Metro area, I have often wondered why bases in mountainous areas do not have some sort of outdoor driving courses. I am sure there are many incoming people who have never driven in this type of terrain, especially in the snow and ice of winter. Such a course could give them this experience without danger to life or limb.

If my memory serves me correctly, DRIVER once carried articles on both an "avoidance course" and a "skid pan," as well as the Feb '73 issue's "Experiment at Cape May."

With the amount of unused runways on some bases, I can see no reason why they shouldn't have the works. With the aid of your articles, they could build such courses.

DRIVER magazines are all too scarce around here, but every copy I see is read from cover to cover. Keep up the good work.

**Sgt L. A. Dallas**
2d Comm Sq (ADC)
Buckley ANG Base
Aurora CO 80011

*"The Science of Skid Control" appeared in Mar '71 DRIVER. An accompanying Editor's note suggested a skid-pan course for each Air Force major command, and told of The Liberty Mutual Insurance Company's offer to provide advice on design of the areas, as well as to train selected individuals as instructors. The program was not accepted, however, and DRIVER's recommendation was regretfully withdrawn.*

*The University of Southern California collision-avoidance course was covered in "Have a Piece of Humble Pie," Feb '70 DRIVER, and again in "Showdown at Mira Loma," May '71 issue. The Cape May "Experiment" pictures and tells how the U.S. Coast Guard teaches its drivers to survive. We'll have another feature on that outstanding course in a forthcoming issue.*

*Before taking steps to establish such a course, you are advised to first request permission through your local command channels.*

## FOR BIKE "NUTS" ONLY!

I belong to a cycle club in San Diego, and have been reading and using your fine magazine for as long as my ship has received copies. There have been many items of value published. Although I feel the benefits are very good, I am concerned with producing a good cycle image to the public.

I'm referring to page 11 of the Nov '72 issue. The switching of taillight leads is a good idea; I've used it, and it can also apply to many autos as well! The title, "For Bike Nuts Only," is my objection. I don't think a person is a "nut" because of his or her choice of transportation, and I feel this type title gives others the idea all of us bikers are nuts, which is probably only partially true!! I've been riding for 12 years, now, and find I'm still looking for more and better ways to keep out of trouble. Keep up the good work!

**MMCS (SS) John Gelles**
**USS Blue Ridge LCC 19**
FPO San Francisco 96601

*Thanks for the kudos, Chief. Sorry you've taken exception to the "Bike Nuts" moniker, but we've been using that as a title for the recurring feature for some years, now. Also, we understand it is a friendly term that was concocted by the bikers themselves. Let's hear from the rest of you . . . uh . . . bike buffs. Shall we discontinue that title?*

## RETIRED MARINE

Part III of "The Back-Yard Mechanic," Mar '73 DRIVER, is so perfectly written that I am sure my 14-year-old son will now be able to service the family car for me; however, the last paragraph could have been more specific. A "factory-trained" mechanic used an air wrench to tighten the pan on the automatic transmission, and proceeded to squish the gasket out around the edges and deform the pan. Maybe you should mention proper torque specifications!

Thought you would like to know that private individuals are buying the magazine.

**Richard A. Warner**
Capt, USMC (Ret)
1209 Poppy Ave
Pensacola FL 32507

*Thanks for the boost Captain. We haven't the space to give the specs for all makes and models. The last paragraph advised: "Give special attention to tightening the oil and automatic transmission pans," and Part IV warned: Don't overdo it . . . anything past 'good-and-snug' may distort the gasket or pan. . . ." Your mechanic should have used a torque wrench, after looking up the spec in the manual.*

## WHY, MISS DRIVER!

I must say that your Mar '73 "Miss DRIVER" sure is going about the wrong way to change a taillight bulb. Hope she does no damage to the car with the screwdriver; it looks as if she is trying to pry the light unit out. Must not be her car.

**Sgt Lawrence L. Taggart**
2460-G Cochran Street
Kaneohe Bay Marine Corps AS
FPO San Francisco 96615

I am thoroughly convinced that Miss DRIVER, Mar '73 issue, does not know what she is talking about. . . . If she really did maintain her car's taillights, she would be well aware that to take off the lenses requires a trunk key to open the trunk, remove the outer protective cover, and remove the bulb—all done from the inside. . . .

**YN2 D. L. Pleasant**
Patrol Sq THIRTY ONE
NAS Moffett Fld CA 94035

*"Miss DRIVER" is an attraction-type feature designed primarily to cause the reader to think about the accompanying safety message. Miss Palmer wasn't working on the Ford—just*

LET'S HEAR IT FOR DRIVER!!
YOU'VE NEVER HEARD OF BLANKET APPROVAL?
IF THIS PORTABLE FOX HOLE IDEA BOMBS, WE CAN SELL THEM SURPLUS AS REC VEHICLES!
HOT DOPE

*posing for the photo, with the screwdriver aimed at the taillight. The job is done inside the trunk of our photog's car, but from the outside of others. He felt her comely features should be facing the camera, rather than the inside of the trunk.*

## GOOD NEWS FOR MOTORCYCLISTS

I would like to have any and all info on the wearing of protective clothing while riding a motorcycle and wearing the U.S. Air Force uniform.

**SSgt Robert H. Rogers**
67 ARRS, Box 66
APO New York 09405

*That info was published on page 27, Dec '71 DRIVER, under "Good News for the Motorcyclist." It read, in part: "The new regulation [AFR 127-5] (dated 30 Sep '71) now permits wearing a non-decorated leather (or simulated leather) jacket or field jacket, boots, and gloves with the uniform. It also permits wearing of any color protective helmet which may be decorated with non-military insignia and reflective tape to provide maximum visibility as long as the insignia does not discredit the uniform or the country where displayed."*

## COAST GUARD FAN

Attached you will find my list of unsafe practices pictured in the contest photo.

I enjoy reading DRIVER. Very informative.

**EN2 James M. Malone**
CGC Obion (WCR-65503)
Station R, Box 12128
Louisville KY 40212

*Thanks. Good to hear from the Coast Guard.*

## NATIONAL SAFETY COUNCIL WORKSHOP

Especially enjoyed your article "Experiment at Cape May," Feb '73 DRIVER. Many of the exercises described are similar to those in our Winter and Emergency Driving Workshop for Driver Educators (described in the inclosed form). We would be pleased to have you apply for the 1974 program; for details, write our Driver Education staff representative, Don Upton. Your participation and an ensuing article in DRIVER would be a most salutary event.

With absolutely no pretense at modesty whatsoever, I have also inclosed a brilliant article from TRAFFIC SAFETY describing several crash-avoidance principles which parallel those in your "Experiment . . ." article. Your readers may have a copy for the asking.

**Kenneth F. Licht, Mgr**
School and College Dept
National Safety Council
425 No. Michigan Ave
Chicago IL 60611

*Thank you very much. DRIVER plans to be there, and we hope to get some excellent photos and material for a really informative feature. In the interim, DRIVER will return to New Jersey and write a sequel to "The Cape May Experiment." Watch for it in a forthcoming issue.*

## MARINE CORPS "HOT DOPE SHEET"

From time to time we find articles in magazines such as yours which we feel are informative, to the point, and timely in our quest for accident prevention material. Your permission is sought for blanket authority to reprint in the Wing's "Hot Dope Sheet" any DRIVER articles which we find useful.

**Capt R. J. Condon**
**Ground Safety Officer**
2d Marine Acft Wg
Marine Corps Air Sta
Cherry Point NC 28533

*We're happy to have you reprint the DRIVER articles. We never make mistaks, of course, but prefer your letting us know which items you intend to use—so we can update any reference to regs or directives which might have been superseded.*

## MILITARY AIRLIFT WING SAFETY

Request blanket approval for the 436 Office of Safety to reprint articles appearing in DRIVER magazine.

All articles will be reprinted on our 436 MAWg Safety Bulletin form. The information is disseminated to all base personnel, and greatly enhances their safety education.

**Maj Kenneth C. Ensslin**
Chief of Safety
Hq 436 Mil Alft Wg (MAC)
Dover AFB DE 19901

*You certainly have our permission to reprint DRIVER articles in your MAWg Safety Bulletins. We do request, however, that you contact us first to insure currency and correctness of the information covered in each article to be reprinted.*

## ARMY REC VEHICLE SAFETY

I am president of a sundry fund association dealing with recreational vehicles. DRIVER's Apr '73 article, "Rec Vehicles Are Fun," is of special interest to the association, and I intend to distribute copies to all member families.

I sincerely hope that Army units will continue to get distribution of your magazine. Its articles are informative and very readable.

**Capt Joseph Weston II**
Safety Officer
720 Military Police Battalion
Fort Hood TX 76544

*Go, Army! We appreciate your interest.*

## STARS AND STRIPES

We're going to increase our automotive content. Can we get hold of your issues from Jan '72 on? And could you tell me how long you keep the raw material from layouts, so we can tell how far back we can come begging?

You guys still have the second-best service publication going. No false modesty here.

**Mert Proctor**
Managing Editor
European Edition
The Stars and Stripes
APO New York 09175

*Requested issues sent; artwork on hand since June '67; permission granted. DRIVER is indeed flattered to be recognized as "second-best" by the head of such an outstanding publication.*

**The Jeep's** construction provides minimal protection for riders—especially in a rollover. It was designed for quick and easy loading and unloading. In no way should it be thought of as "a versatile form of the automobile."

continued from page 5

## THE INSCRUTABLE MILITARY JEEP

end deeper into the turn. Once the Jeep is headed straight, the driver can slow down with a few gentle taps on the brake pedal.

### ROUGH TERRAIN

Because of the Jeep's toed-in wheels, there's a hazard connected with driving on rough ground over obstacles. If the front wheels are at an angle when they leave the ground, they will tuck under when they come down. The result: the Jeep flips.

The Army has conducted a redesign study on the M151 Jeep suspension. Unfortunately, the cost of modifying the suspensions of the large number of military Jeeps on hand is prohibitive. A new model Jeep, the M151A2 fitted with a solid rear axle, is gradually replacing the M151A1 in both the Army and Air Force. It will handle much the same as conventional vehicles and should be safer on the road.

### CARGO JEEPS

The Jeep has many uses other than carrying people. When fitted with a recoilless rifle, or when set up as a field ambulance, it is equipped with heavy-duty overload springs to support the extra weight. Remove this extra weight, and the heavy-duty springs expand causing the Jeep to ride higher, with even less stability. This condition greatly increases its rollability.

Army instructors told DRIVER the best way to corner a Jeep, or any vehicle for that matter, is to reduce speed before entering the turn and to steer gently through the curve. Use just enough throttle to keep the vehicle moving at a safe speed.

### NOT FOR SALE

Because of its unreliable road handling characteristics, sale of the M151 Jeep on the commercial market as a surplus military item is forbidden. Civilian safety officials consider it too dangerous for the untrained driver to handle.*

### ANYONE CAN DO IT

Not even the Army's skilled instructors are immune to the M151's tricks. One sergeant, attempting to show his students on the motor pool parking lot just how far he could force the Jeep in a turn before it rolled, lost it—and over he went. He got out of it unhurt, but shaken.

"When they finish this course, these drivers are well prepared to drive the Jeep," an instructor told DRIVER. "Even if they never go any further in our driver training program, they are more cautious overall drivers, even in their POVs. When they learn how unreliable a vehicle as small as the Jeep can be on the road, it makes them suspicious of every car."

No, driving the Jeep is definitely not to be taken lightly. This vehicle needs very special handling and a driver who is not only familiar with its peculiar hang-ups, but keeps them in mind constantly. ●

** See "Army Jeeps Too Hazardous for Public Use," Oct '72 DRIVER. Also, "Miss DRIVER," Apr '72 DRIVER.*

continued from page 13

## MISS DRIVER

which will eventually be available to all the services, and the public as well.

"You see, we are all anxious for you to be the type of driver who doesn't have accidents. This means more than keeping your car looking great. It means knowing how mods affect handling, and why it is a MUST to use seat belts, and take other safety precautions. I'll see you in the movies." ●

## ABOUT MISS DRIVER

(see page 13)

Lovely brown-eyed Cynthia Myers is an experienced model and actress. A resident of Beverly Hills, Cynthia has appeared in PLAYBOY magazine 16 times. Her interests include horse training (jumpers and polo ponies), racket ball, tennis, and snow skiing. Cynthia has a word of caution for DRIVER readers. "Watch out for women drivers who window shop from the driver's seat." ●



☆U.S. GOVERNMENT PRINTING OFFICE: 1973—789-421/10

"Just let 'em run me into the wall tonight!"

"And this is our Godfather model; it comes with an extra hood. . . ."

"This is one old car that won't pollute any more; I welded the exhaust valves shut."

## CAPTION CONTEST WINNERS

**1. "Who says motorcycle only?"**

Audio Visual Section
USAF Special Operations School
Eglin AF Auxiliary Field No. 9
Florida 32544

**2. "Ha! You think this is funny, wait until you see the other guys trying to get IN to their cars!!!!"**

A1C Robert E. Gessler
PSC Box 2812
Shaw AFB SC 29152

**3. "Now, as soon as I find my other skate, we'll race."**

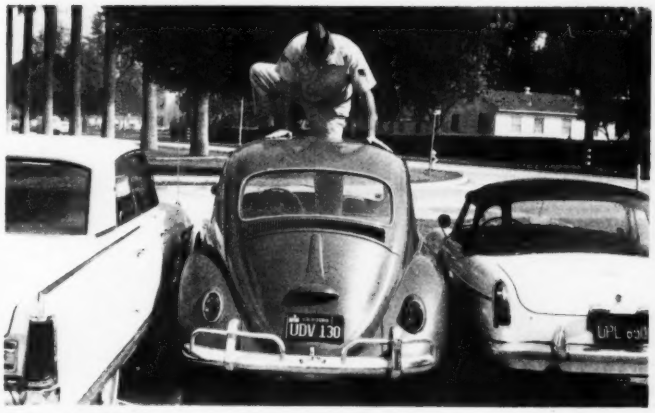
Flight Section
Hq and Maint Sq 13
Marine Corps Air Station
El Toro CA 92709

**4. "When the Colonel said I rated my own parking space, I knew there had to be a catch somewhere."**

Kenneth V. Benesh
9335 California
Fairchild AFB WA 99011

**5. "CE finally repainted the lines for the parking lot."**

Mrs. David R. Mullens
Lot 45, Buckingham Village
Universal City TX 78148




### HONORABLE MENTION

1. **Dietrich Junge**
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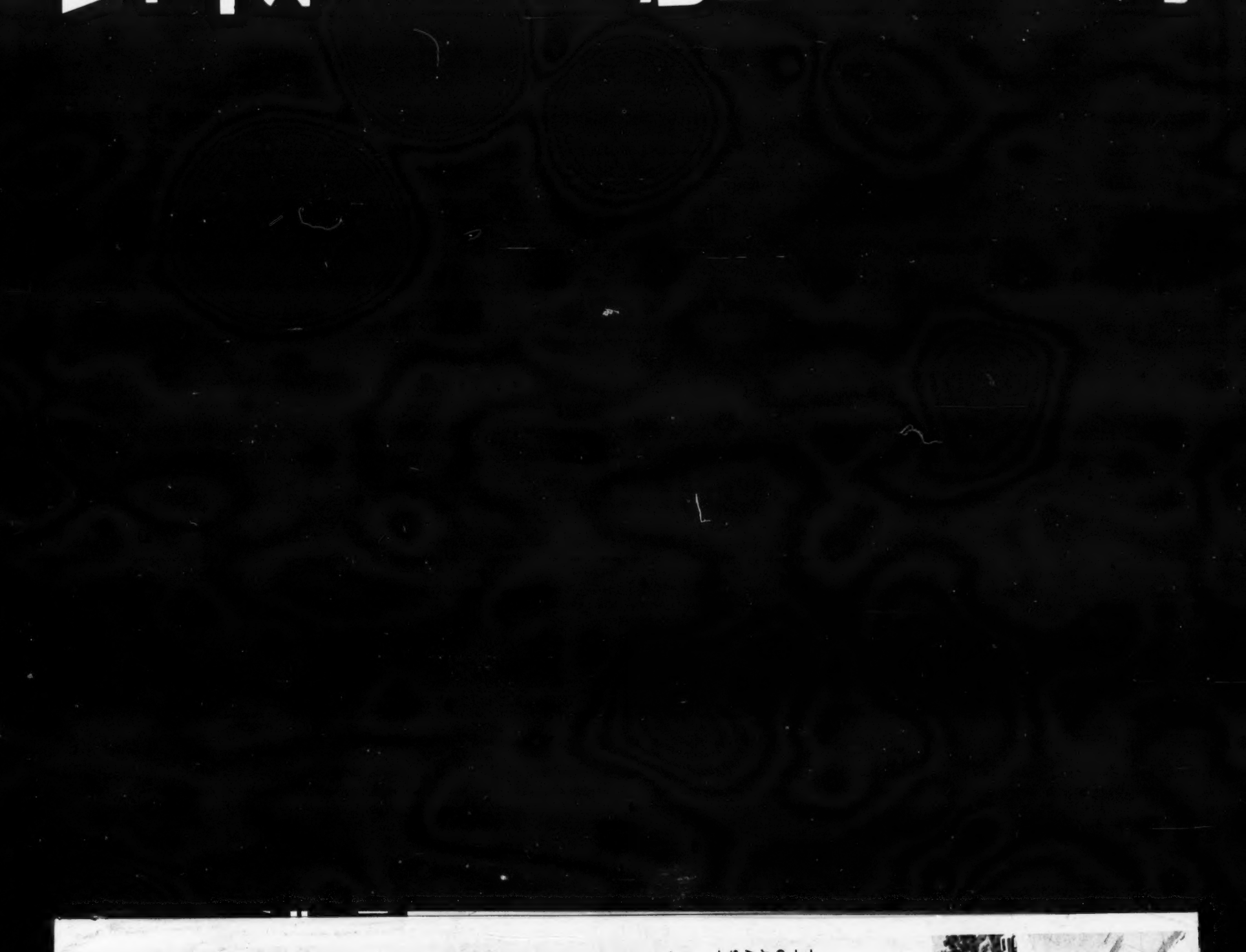
# GOING GOING GOING GONE

California Highway Patrol Motorcycle Officers will soon be a thing of the past. Why? The main reason is the danger to the patrol officer. The CHP finds when a cycle is hit by a car, the cycle can usually be put back in shape in only a couple of days. But returning the patrolman to the saddle is another story. If he survives, he is usually hospitalized for a long stretch at full pay. Therefore, it's actually cheaper to put two men in one car than to have one man on a motorcycle.

Seems there's a message here. Motorcycling is great fun, but unusually hazardous. We hope our rider readers always keep this in mind, and compensate by being super cautious. ●